



Preliminary Prospectus

Utah Department of Transportation



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1.0 Introduction

The Utah Department of Transportation (UDOT) plans, designs, constructs, and maintains highway facilities throughout the State of Utah. In Utah County many highway facilities involve impacts to wetlands and other waters of the United States (waters of the US). When these resources are affected by UDOT projects, measures are implemented to avoid, minimize, and mitigate for unavoidable impacts.

UDOT proposes to establish the Northern Utah County Wetland Mitigation Bank (Bank) at a site in Lindon City in northern Utah County, Utah (Lindon site). The purpose of the Bank is to provide compensation for unavoidable stream and wetland impacts resulting from highway projects within the Bank's primary and secondary Geographic Service Area (GSA). The GSA is discussed in detail in Section 4.0, Proposed General Service Area.

The Bank is intended to provide compensatory mitigation for losses of aquatic resources that help to sustain or improve watershed function, and to support the objective of the Clean Water Act, which is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters [33 U.S.C. 1251(a)]. Through the Bank, UDOT will restore, enhance, consolidate and preserve aquatic resources on approximately 102 acres of land ecologically suitable for providing desired aquatic resource functions and services. These aquatic resource functions, in turn, will be used as compensatory mitigation for impacts that result from construction activities authorized under Section 404 of the Clean Water Act and that occur in the prescribed GSA. Ultimately the Bank will contribute positively toward achieving the Federal Wetland Program's "no net loss" goal.

The high-quality ecological characteristics of the aquatic resources at the Bank will provide superior function and service as compensatory mitigation. In addition, the large scale of the Bank and its regional proximity to other natural resources of importance (i.e. Utah Lake and other parcels used for wetland mitigation) can create extended ecological value. The restored and enhanced aquatic resources will be designed to be self sustaining, functional systems typical of Utah Lake and Jordan River aquatic ecotypes.

During the Bank site selection process, UDOT placed a high priority on selecting a site based on how it fits within the watershed and how it can potentially contribute to the overall watershed function. For this reason, site selection considered and focused on locations with previously drained or degraded palustrine forested, palustrine scrub shrub, and palustrine emergent marsh wetlands, wetlands that have been converted to agricultural uses and areas that

have the greatest potential to discharge to non-wetland waters of the US (such as Utah Lake) and jurisdictional wetlands. This approach considers how the types and locations of compensatory mitigation will provide the desired aquatic resource functions and services, and how the resources will continue to function over time in a changing landscape. It also considers the habitat requirements of important species, habitat loss or conversion trends, and current development trends as well as the requirements of other regulatory programs that affect the watershed, such as stormwater management or habitat conservation programs.

1.1 Interagency Review Team (IRT)

The US Department of Army Corps of Engineers (USACE) has established and chairs the Interagency Review Team (IRT) for the proposed Bank. The IRT oversees the development of the Bank and ensures the mitigation goals and objectives are satisfied. The IRT in coordination with UDOT will determine the credit and debit procedures. IRT members include:

- Utah Department of Transportation
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- Federal Highway Administration
- Utah Division of Wildlife Resources

The IRT meets monthly to discuss issues, progress, opportunities, and requirements for the Bank.

2.0 Proposed Mitigation Bank Objectives

UDOT's goals and objectives for the proposed Bank are to:

- Restore, enhance, create, consolidate, and preserve wetlands and their functions and services to compensate in appropriate circumstances for unavoidable wetland and stream impacts authorized under Section 404 of the Clean Water Act as deemed appropriate by USACE after consultation with members of the IRT.
- Restore, enhance, and preserve wetland types appropriate to the watershed and that generally match the wetland types that would be impacted within the GSA.
- Utilize overflow drainage and stormwater as delivered through a series of existing ditches originating in the cities of Lindon and Pleasant Grove and groundwater to create a self-sustaining hydrologic support system for the restored and enhanced wetlands. Improvements will be constructed in the water delivery system to raise and stabilize the groundwater table on portions of the site and to create permanent diversion points for surface water flows. Improvements will be designed to allow flexibility in regulating water (i.e., the ability to raise and lower the water surface elevations) during the wetland establishment period. Once the wetlands are established, the structures in the delivery infrastructure can be fixed to a permanent setting that requires infrequent human intervention.
- Meet the requirements of the Final Mitigation Rule under Department of the Army, Corps of Engineers 33 CFR Part 332; Environmental Protection Agency 40 CFR Part 230; Compensatory Mitigation for Losses of Aquatic Resources.
- Provide a net gain of wetland functions and services on the Bank site to compensate for UDOT / FHWA project impacts.
- Provide a basis for funding for long-term operation and maintenance of wetland mitigation for UDOT projects.

3.0 Establishment and Operation of the Bank

Establishment of a mitigation bank in northern Utah County will provide UDOT a unique opportunity to restore, enhance, consolidate, manage, and protect wetlands resources more effectively for several proposed highway projects in this area of Utah. The required mitigation will be better integrated with supporting ecosystems (such as Utah Lake), more effectively managed, provide more services to society, than would individual project-based mitigation that might occur in several locations within the GSA. The Bank will be easier for UDOT to monitor, manage and maintain in one location compared to scattered on-site mitigation projects. Development of the Bank at the Lindon site provides additional buffer and wildlife habitat adjacent to the east shore of Utah Lake.

UDOT will purchase the land for the Bank, design and construct site improvements, and monitor, manage and maintain the Bank until all of the Bank objectives are fully realized and the IRT has signed off on satisfactory completion of the agreed upon requirements.

4.0 Proposed General Service Area (GSA)

The Bank general service area (GSA) is broken down into the primary and secondary service areas. The service areas have been defined in coordination with the US Army Corps of Engineers. The proposed service areas are shown in Figure 1 and Figure 2.

4.1 Primary Service Area

The primary service area is defined as follows:

- Northern Boundary: Utah County/Salt Lake County Line.
- Eastern Boundary: Elevation 4,590 Feet above mean sea level (MSL): elevation at the toe of the Provo Level of Lake Bonneville.
- Southern Boundary East of Utah Lake: Southern Boundary of the Provo River Hydrological Unit (HUC 16020203).
- Southern Boundary West of Utah Lake: Pelican Point
- Western Boundary: Elevation 4,590 Feet MSL: elevation at the toe of the Provo Level of Lake Bonneville.

4.2 Secondary Service Area

A secondary service area has been established for the Lindon Bank site which accounts for wetlands that provided different functions and services that normally occur beyond the primary service area. Wetlands impacted within the established secondary service area can be mitigated at the Lindon site at a higher ratio than those wetlands impacted within the primary service area. The establishment of this additional service area will allow for maximum utilization of the Lindon site and also consider the various functions and services that may be lost.

This secondary service area is established to parallel only the eastern boundary (4,590 MSL) of the primary service area and at an elevation of 4,740 feet above mean sea level (MSL). This elevation of 4,740 is representative of Utah Lake Bonneville at the Upper Provo Level.

4.3 Service Area Addenda

The proposed GSA has been amended south of the original southern boundary east of Utah Lake (Provo River Hydrological Unit). This additional area added to

the GSA will provide mitigation for all functions and services of a contiguous section of wetlands adjacent to I-15 (see Figure 2).

Figure 1. Bank Primary and Secondary Service Areas

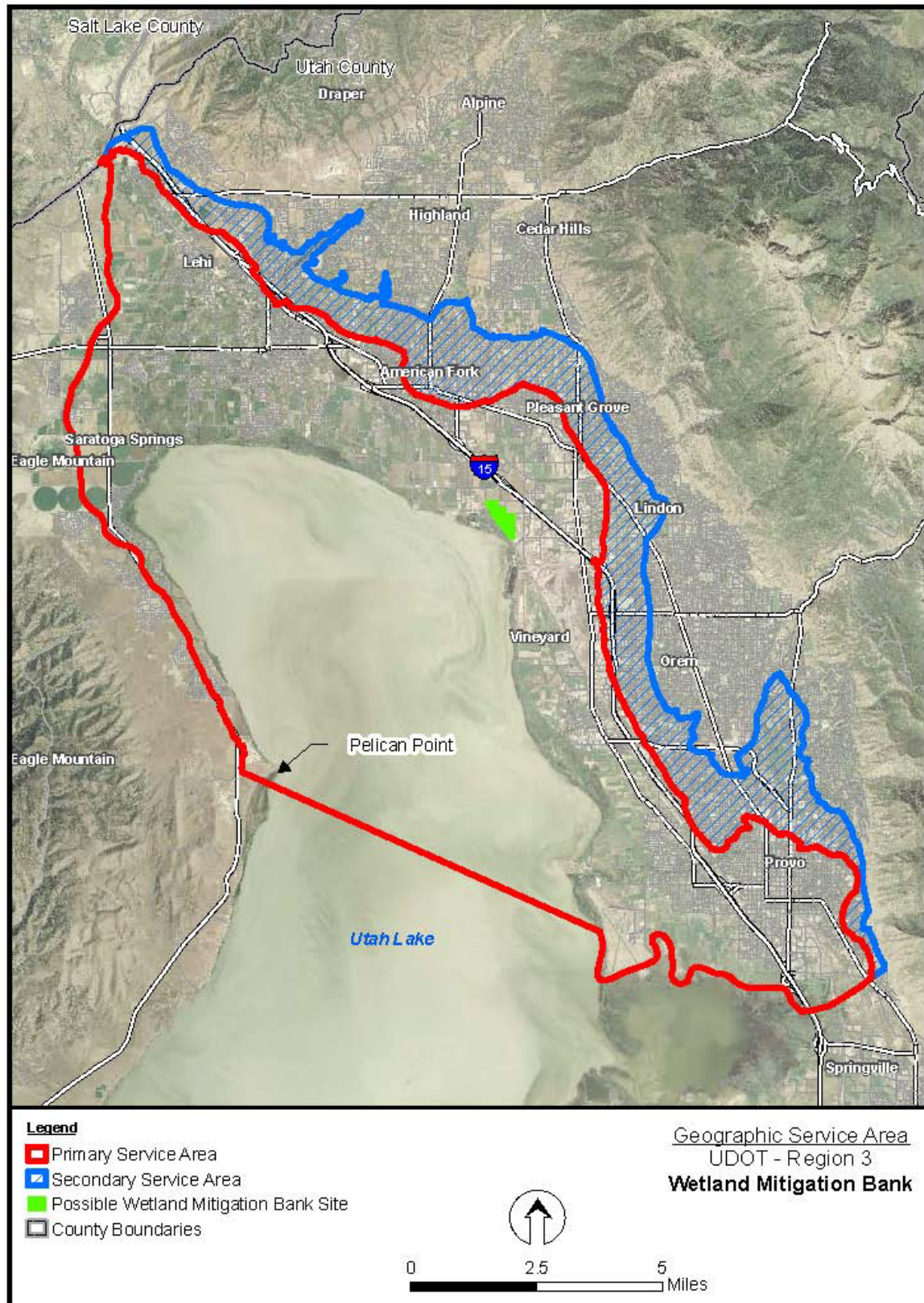
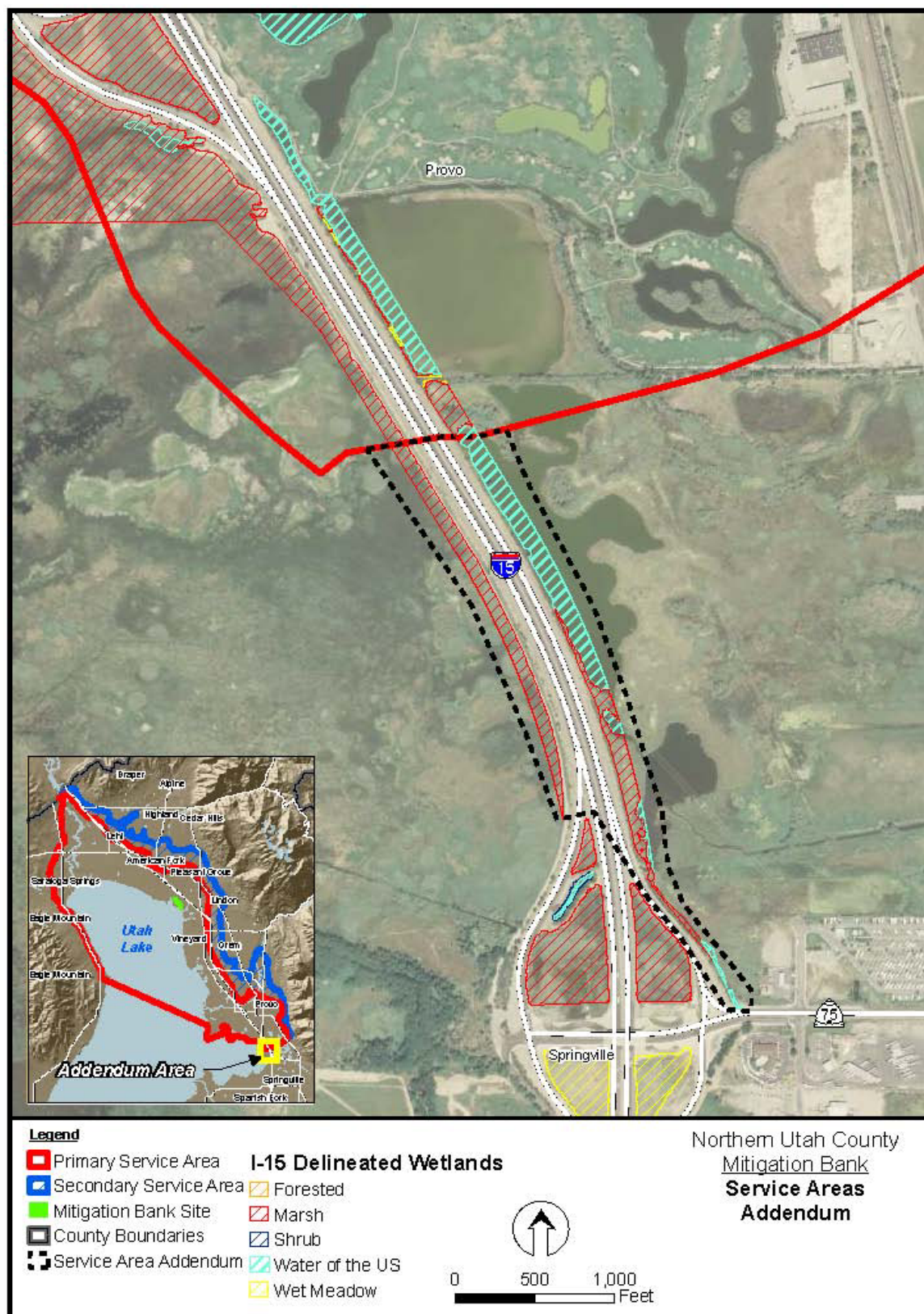


Figure 2. Bank Service Areas Addendum



5.0 General Need for and Technical Feasibility of the Proposed Bank

5.1 Need

The March 2008 Final Mitigation Rule establishes a preference for the use of credits from mitigation banks when appropriate credits are available. The new rule encourages the use of mitigation banks over use of permittee-responsible mitigation because mitigation banks usually provide consolidated compensatory mitigation projects that have less risk and uncertainty (DOD and EPA 2008).

UDOT has a number of road projects scheduled to go to construction beginning in the summer of 2008. These projects will result in unavoidable wetland and stream impacts. UDOT intends to mitigate for unavoidable impacts associated with the following projects using credits from the proposed mitigation Bank:

- East-West Connector
- Vineyard Connector
- I-15 Corridor, Salt Lake County to Santaquin, Utah County
- Geneva Road
- Mountain View Corridor

5.2 Technical Feasibility

Development of a mitigation bank at the Lindon site is technically feasible. The site is within ¼ mile of Utah Lake and was likely all wetland prior to settlement of the area that resulted in development and land use changes. One of the main features that presently separates the Bank site from Utah Lake and influences surface water connectivity is the Southern Pacific Railroad (also known as the Union Pacific Railroad) track embankment. The site very likely still has a direct groundwater connection to Utah Lake.

A majority of the credits at the proposed Bank will be realized through restoration of former wetlands. The wetlands will be restored by removing grazing from the site, supplementing existing hydrology to support desirable wetland plant communities, management of invasive and weedy species, and protection from degradation.

6.0 Proposed Ownership Arrangements and Long-term Management Strategy for the Mitigation Bank

6.1 Proposed Ownership Arrangements

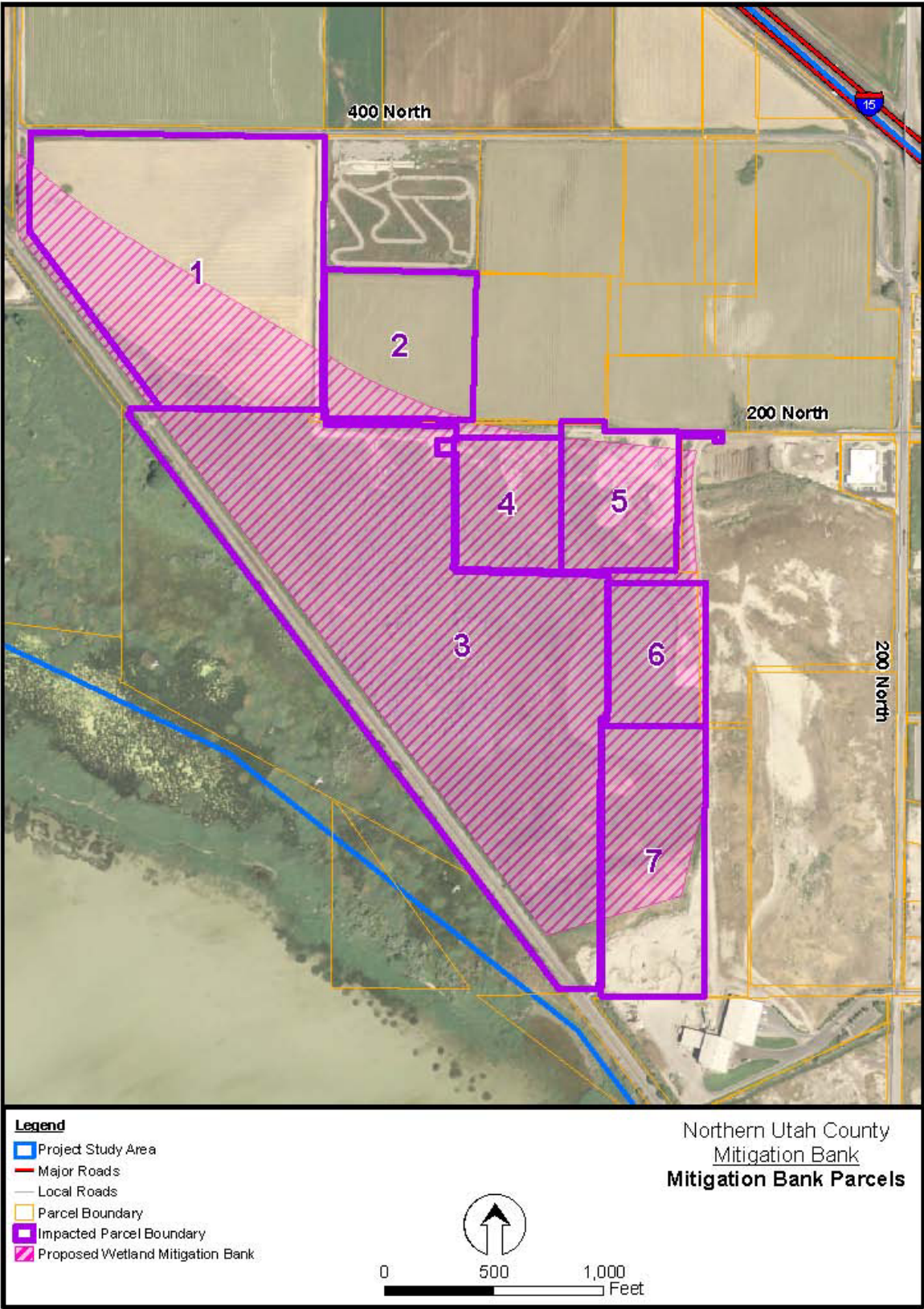
UDOT intends to purchase a minimum of seven parcels associated with the proposed Bank site. All or portions of these seven parcels will be acquired. The actual property acquisition will be dependent on the Vineyard Connector alignment that is selected through the northern properties. Additional parcels may be added to the Bank if necessary to reach the required number of credits necessary to mitigate for the projects within the GSA. These seven parcels are listed in Table 6-1 and are shown in Figure 3.

Table 6-1. Mitigation Bank Parcels

Parcel #	Serial No.	Property Owner	Potential Acquisition Acreage
1	130790004	LDS Church	14.83
2	140590037	Starline Properties LLC	2.01
3	140580013	Utah County Solid Waste	54.92
4	140580011	Utah County	6.83
5	140580004	Utah County Solid Waste	7.13
6	140580001	Utah County Solid Waste	6.60
7	140580002	Utah County Solid Waste	9.60
Total Potential Acreage of 7 Parcels			101.92

UDOT will record a restrictive covenant, easement, or similar maintenance agreement for the property contained within the mitigation bank. This agreement may also be transferable to an acceptable conservation organization upon fulfillment of project objectives with Bank Site ownership remaining with the titled owner. The agreement will provide for the perpetual protection and preservation of the Bank. These provisions will conform to the current Sacramento District, U.S. Army Corps of Engineers guidance with the language modified on a case-by-case basis to allow for specific activities. The real estate instrument used must be approved by the IRT.

Figure 3. Mitigation Bank Parcels



6.2 Monitoring and Maintenance

Performance monitoring will be implemented to determine the degree of success of the mitigation effort. Monitoring will include periodic surveys and Bank site evaluations until UDOT demonstrates to the satisfaction of the IRT that all performance standards have been achieved. Monitoring will adhere to current USACE standards and any other standards established by the IRT which may include the following: measurements and observations of site stabilization, wetland hydrology, vegetation cover, plant survival, vegetation structure and species composition, wetland functions and services, and non-native weed invasion.

Maintenance and remedial action on the Bank site will be implemented immediately upon completion of the first monitoring event unless otherwise agreed by UDOT and the IRT. Maintenance will be performed as necessary to address any conditions that could jeopardize reaching the Bank's performance standards. If there is a significant problem with achieving the performance standards, UDOT will coordinate with the IRT to develop a contingency plan. Contingency actions may include, but are not limited to many of the items listed below and will be implemented if the performance standards are not met.

- Re-grading of target areas that after inspection do not have adequate hydrology.
- Implementation of additional erosion control features and Best Management Practices (BMPs).
- Re-plant or reseed areas that fail, after reason for failure has been identified (e.g., moisture regime, poor plant stock condition, disease, shade/sun conditions, wildlife damage, vandalism, etc.).
- Remove/control weedy or exotic invasive plants (e.g., Russian olive, salt cedar, reed canarygrass, common reed, etc.) by manual or chemical means. Use of herbicides or pesticides within the Bank area would only be implemented if other sustainable measures failed or were considered unlikely to be successful.
- Refinement of water control structures.
- After consulting with the IRT, minor excavations would be made to correct surface drainage patterns and improve site hydrology.

- During the first 5 years after construction, wildlife damage control measures may be taken to control voles, beaver, deer etc. that may include sprays, plant coatings, physical barriers, trapping and removal.
- Clean up trash and other debris on a semi-monthly basis or more frequently as needed.
- The annual monitoring reports will notify the IRT of annual maintenance activities that are performed at the Bank.

6.3 Adaptive Management

During the maintenance / monitoring period, certain improvement phases or portions of improvement phases may not meet the milestone achievements as outlined. It is the responsibility of UDOT to implement adaptive management during the maintenance period to ensure that the improvement areas are upgraded to meet all of the milestone achievements. If UDOT is not addressing corrective actions through the annual maintenance work, the IRT can request in writing that UDOT prepare a remediation plan. In such cases, UDOT would prepare the remediation plan, submit it to the IRT for their information, and implement the plan according to a schedule agreed to with the IRT.

If the milestone achievements as outlined in this Prospectus are not in full force at the end of the prescribed monitoring / maintenance period (i.e., four full growing seasons following the completion of construction) then the monitoring / maintenance period will be extended until the milestones have been fully achieved.

UDOT will not be responsible for remediation damages that occur to the Bank that are a result of natural catastrophes such as flood, drought, disease, regional pest infestation, and the like that are beyond the design parameters or control of UDOT. The determination of such catastrophic occurrences will be evaluated through the use of all naturally occurring reference wetlands that exist within a two-mile radius of the Bank site.

7.0 UDOT's Qualifications

This section describes the qualifications of UDOT to successfully complete the type(s) of mitigation project proposed, including information related to UDOT's existing Galena Bank and other mitigation projects.

UDOT is a state agency, with in-house environmental resource experts, landscape architects, construction experts and contracted consultants that have the expertise and experience to design, develop, monitor, maintain and manage the proposed Bank.

UDOT has past experience in the development of a mitigation bank and on-site, in-kind mitigation providing mitigation for project impacts. UDOT developed a 25.35 acre mitigation bank known as the "Galena Bank" in Salt Lake County, Utah, to compensate for road project impacts in that area. The bank was established in 2006 and is currently operational. UDOT is managing that bank in consultation with the Corps of Engineers and other federal and state agencies. Credits are being debited from the bank.

UDOT developed the Legacy Parkway/Preserve to mitigation impacts on the Legacy project. Other UDOT Region 3 mitigation projects include:

- Salem City Sewer Treatment Facility – Utah County (Photo 1)



- Bullock Wetland – US-189 – Utah County

- Spanish Fork Canyon – US-6 – Utah County (Photo 2)



- Creamery Creek – US-40 – Wasatch County (Photo 3)



8.0 Bank Site Suitability

This section describes the ecological suitability of the site to achieve the objectives of the proposed Bank, including the physical, chemical, and biological characteristics of the site and how it will support the planned types of aquatic resources, functions, and services.

8.1 Bank Location

The proposed Bank site is located in Lindon City within northern Utah County, in Section 36, Township 5 South, Range 1 East, and Section 31, Township 5 South Range 2 East. It is bounded on the east by an access road to the North Pointe Solid Waste Transfer Station and a capped landfill, on the west by the Southern Pacific Railroad, on the south by the transfer station, and on the north by agricultural fields (see Figure 3 above). Current site conditions include agriculture fields, ditches, pasture, native and non-native plants including Russian olive trees and saplings, grasses (reed canarygrass, salt grass), rushes, and other herbaceous species. Human disturbances on the site include excavated areas, power and gas line easements, topsoil and composting operation, dog kennel, and graveled lanes.

8.2 Existing Bank Site Characteristics

The proposed Bank site consists of undeveloped land within 1/4 mile of the western shore of Utah Lake. The site supports palustrine forested, palustrine scrub shrub, and palustrine emergent marsh wetlands, uplands and an open water pond (see Photos 4 and 5).

Most of the site is moderately to intensively grazed at this time by domestic horses and cattle. The topography of the site is relatively flat and the site generally slopes to the southwest. The groundwater table is relatively high throughout much of the site. Groundwater fluctuations occur related to water levels in Utah Lake. Several small springs occur on the western edge of the site near the railroad embankment and are likely connected to the local groundwater table. Surface water will be diverted from existing drainage ditch under existing or acquired water rights associated with Utah Lake and the Jordan River.

Upland areas on the property on the north side of the site are used for composting topsoil and topsoil storage, and a dog kennel is currently being used. These operations would be cleared off the property when the site is developed for mitigation.



Photo 4: Overlooking the open water pond and south end of the Bank site from the top of the landfill.



Photo 5: Overlooking the southern 2/3 of the site from the top of the landfill.

8.2.1 Existing Wetlands

The proposed Bank site presently supports degraded wetlands. UDOT surveyed and delineated wetlands on this site as part of the Vineyard Connector wetland delineation work. Identified wetlands were delineated using the methods described in the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Environmental Laboratory 2006).

Approximately 45.25 acres of wetland and open water have been identified and delineated within the boundaries of the Bank site. The wetland boundaries are shown in Figure 4. Wetland types and other waters of the US present within the Bank site include:

- 8.6 acres – Open Water (OW)
- 3.02 acres – Palustrine Forested (PFO)
- 4.95 acres – Palustrine Scrub Shrub (PSS)
- 28.09 acres – Palustrine Emergent Marsh (PEM)

- The dominant plant species in the palustrine forested community is Russian olive; Russian olive saplings are the dominant species in the palustrine scrub shrub community; reed canarygrass, salt grass, and bulrush dominant the palustrine emergent marsh community on the site (see Photos 6 – 9).



Photo 6: Palustrine forested and palustrine emergent marsh communities on the southern end of the Lindon Bank Site.



Photo 7: Wetland functions and services will be restored/enhanced in the drier portions of the site.

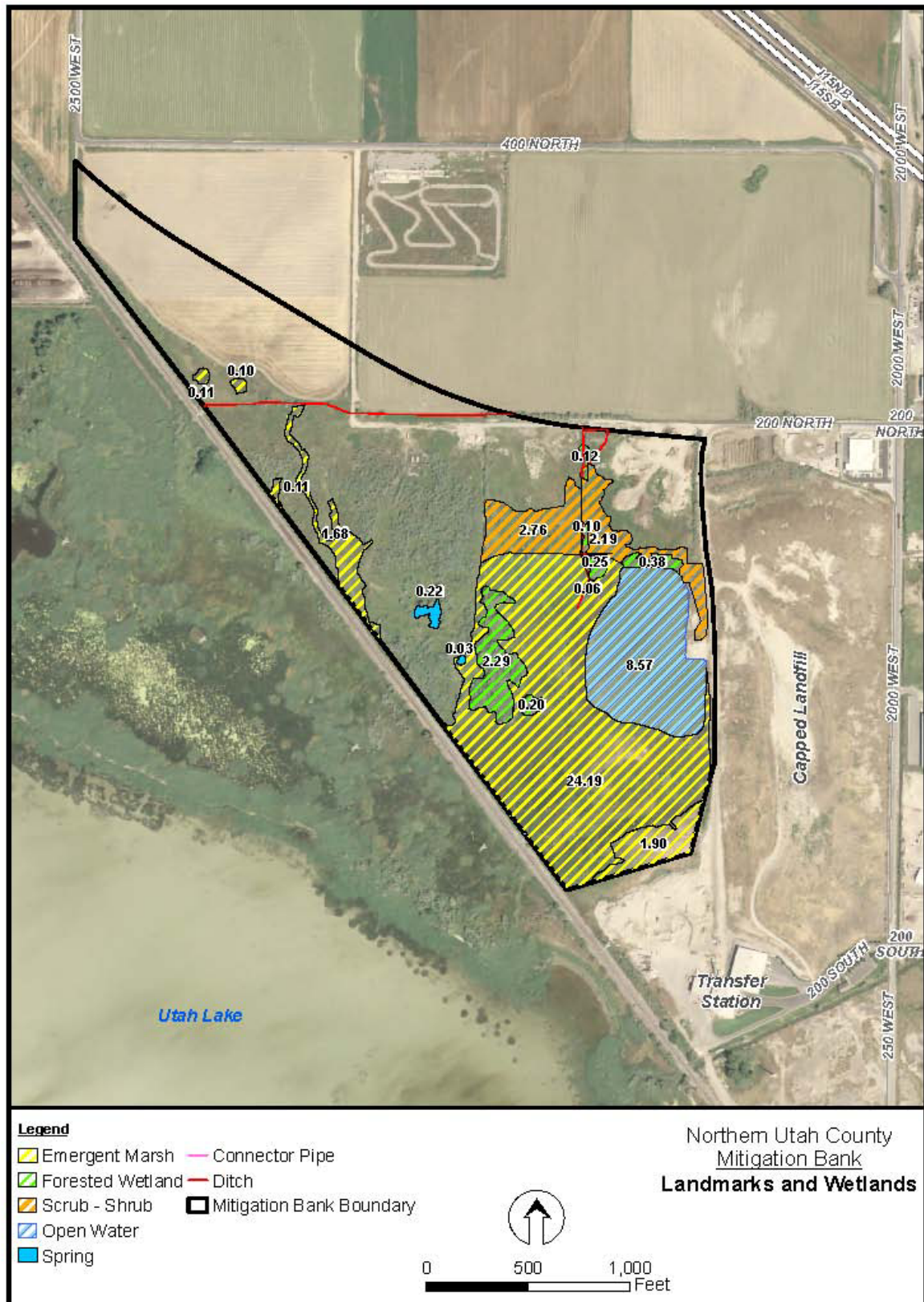


Photo 8: Upland portions of the site will be restored to wetland.

Photo 9: Water moves through the Bank site in a series of ditches.



Figure 4. Landmarks and Delineated Wetlands



8.2.2 Wetland Functions and Services

Wetlands within the Bank site were evaluated for functions and services using the UDOT Wetland Functional Assessment Method (UDOT 2006). Wetlands provide valuable functions for physical and biological systems, and may affect the human environment. Qualitative methodologies have been developed for assessing wetland functional value. These values include: level of disturbance, plant community composition, habitat for federally listed threatened and endangered plant and animal species or state listed species, wildlife habitat, amphibian habitat, fish/aquatic habitat, flood attenuation, short and long term water storage, sediment toxicant retention and removal, sediment/shoreline stabilization, visual quality, and recreational/education potential.

According to the UDOT Wetland Functional Assessment, the wetlands found within the Bank site are classified as Category I, II, and III.

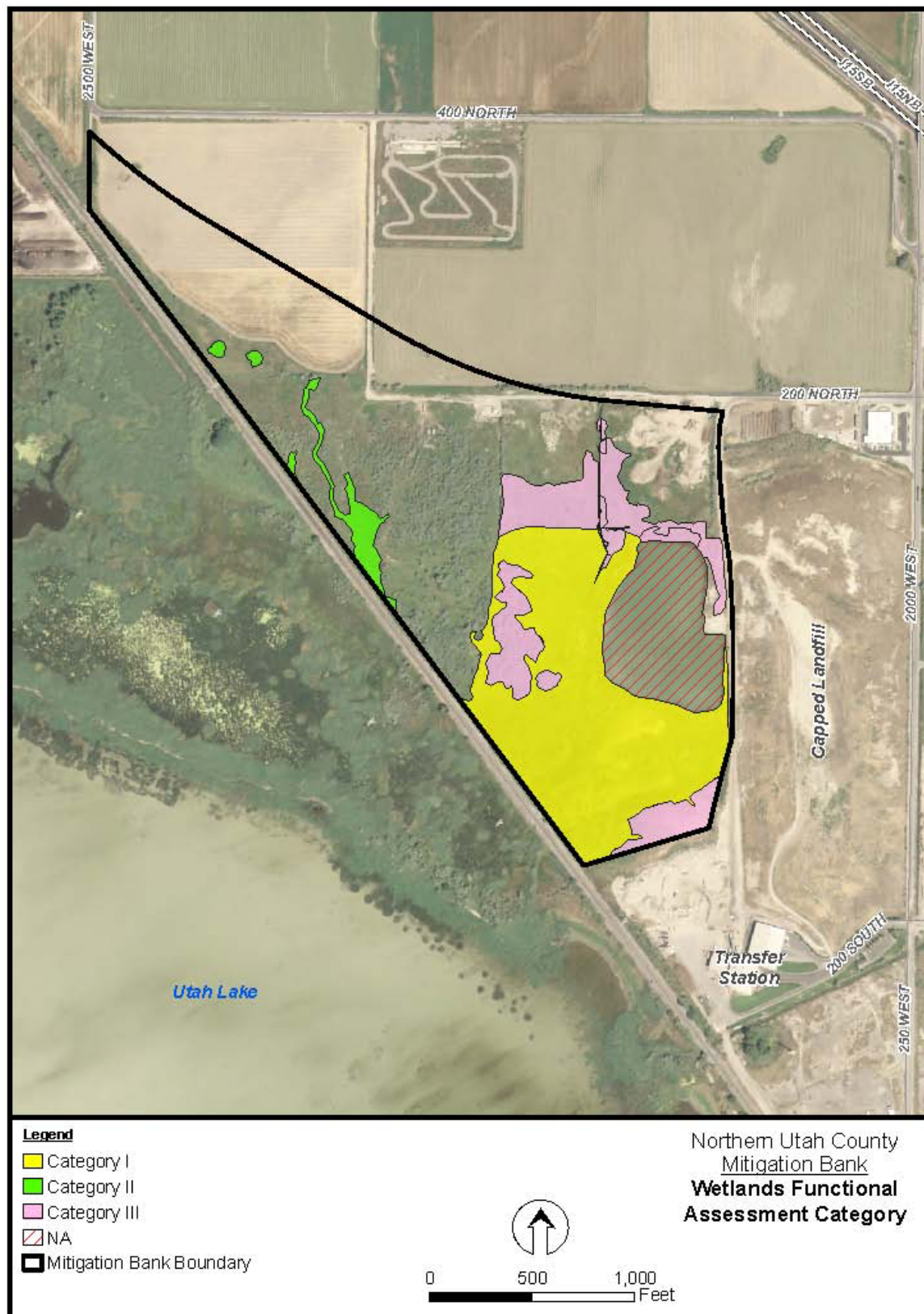
- Category I wetlands are of exceptionally high quality. These wetlands provide irreplaceable ecological functions (e.g. are not replaceable within a human lifetime); exhibit exceptionally high flood attenuation capability; rated exceptionally high for plant community composition.
- Category II wetlands are more common than Category I wetlands, and are those that provide habitat for plant or animal species rated S3 by the Utah Natural Heritage Program, have a low level of disturbance or function at a high level for general wildlife habitat, or general fish/aquatic habitat or have plant communities largely comprised of native plant species.
- Category III wetlands are more common, generally less diverse, and often smaller and more isolated than are category I and II wetlands. Category IV wetlands are generally small, isolated, and lack vegetation diversity and are commonly comprised of non-native species.

Table 8-1 below lists the wetland functional assessment rating. Figure 5 below shows the wetlands by category classification.

Table 8-1. Mitigation Bank Site Functional Assessment Results

Wetland #	Acreage	Wetland Type	Category	Functional Points	Possible Funct. Pts.	% Total Funct. Pts.
R	5.08	PSS	III	2.3	4.9	47%
T1	0.12	PFO	III	2.9	4.9	59%
T2	1.68	PFO	III	2.9	4.9	59%
T3	2.48	PFO	III	2.9	4.9	59%
U	24.19	PEM	I	3.9	4.9	80%
U2	0.72	PEM	II	3.4	4.9	69%
U3	0.11	PEM	II	3.4	4.9	69%
U4	0.10	PEM	II	3.4	4.9	69%
U5	0.11	PEM	II	3.4	4.9	69%
V	8.57	OW	NA	NA	NA	NA
W	1.90	PEM	III	2.6	4.9	53%

Figure 5. Wetland Functional Assessment Category



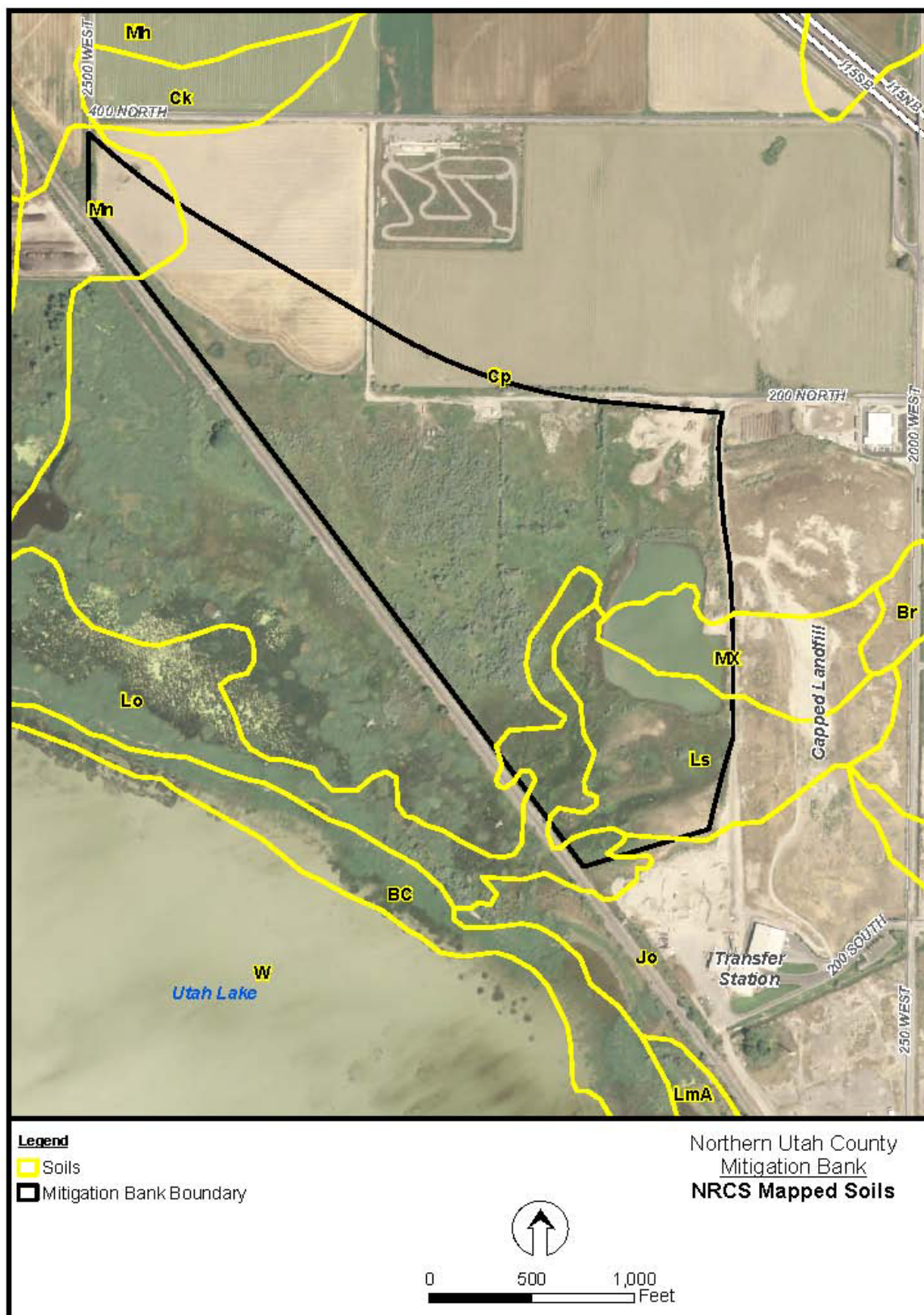
8.2.3 Soils

The soils on the Lindon site are all mapped as hydric, which provides adequate soil composition for wetland development. Once livestock and horse grazing is removed and soil compaction is reduced, normal water infiltration and capillary action can be restored. In most years, the soil is partially saturated for a period of two to six months.

Hydric soils that are mapped within the Bank site include and are shown on Figure 6:

- Cp - Chipman-McBeth Complex
- Lo - Logan Silty Clay Loam
- Ls - Logan Silty Clay Loam, Heavy Variant
- MX - Mixed Alluvial Land, Saline
- Jo - Jordan Silt Loam

Figure 6. NRCS Mapped Soils



8.2.4 Uplands

Uplands adjacent to the site include the existing operating transfer station, a capped landfill, a composting facility, and agricultural fields. The upland section of the Bank site on the western 1/3 of the property is presently grazed by horses and cattle.

8.2.5 Soil and Water Testing Results Summary

Soils, surface water and groundwater within the bank site were collected and sampled for potential harmful constituents. Based on the data collected and analyzed, the following conclusions were reached:

Certain Site soils (potential future wetland soil or sediment) and Site sediment samples contain chemicals at concentrations above fresh water sediment screening criteria. However, toxicity test results suggest that these exceedences are not indicative of actual toxicity with the exception of Area 10. Soil from Area 10 may exhibit conditions that will result in environmental affects above a level of concern if inundated as a result of wetland construction. As noted above the sample representing area 10 could have contained imported fill material. The current plan is to exclude the portion of Area 10 containing imported fill material. This area has been surveyed out of the bank boundary. Surface water contained chemicals below regulated levels. A separate detailed report has been submitted to the IRT, detailing the findings of the sampling and analyses.

8.3 Proposed Conditions

Approximately 37 acres of existing wetland will be enhanced, or preserved within the boundaries of the Bank site. Approximately 3.5 to 4 acres of the existing open water pond will be converted to wetland. The site has available resources to restore approximately 45 acres of wetland from upland area and preserve 3.6 acres of open water habitat. Approximately 12 acres of upland buffer will be developed.

8.3.1 Restoration and Enhancement

Restoration and enhancement of existing, degraded wetlands will be accomplished in accordance with detailed construction documents. The construction activities may include:

- Grazing will be eliminated or intensively managed to provide for optimum vegetation conditions.
- Clearing and grubbing
- Salvage of topsoil
- Salvaging desirable plant material
- Installing water control structures to properly establish hydrology to germinate and grow native hydrophytes and better manage undesirable weedy species
- Planting seed, cuttings, and container plants of indigenous species
- Implementing temporary and permanent best management practices (BMPs) for erosion and sediment control
- Fencing
- Providing habitat structures for wildlife and birds

All disturbed ground will be repaired and restored by successful revegetation with appropriate species, planting methods, and sources of plant materials approved in advance in coordination with the IRT and local agencies as appropriate.

During construction, fencing will be erected to keep horses and cattle out of improvement areas.

All of the wetlands to be restored and enhanced can be classified according to Cowardin et al., 1979, as follows:

- **System:** Palustrine
- **Subsystem:** None
- **Classes:** Forested, Scrub Shrub, Emergent Marsh, Aquatic Bed
- **Subclasses:** Persistent, Deciduous, and Rooted Vascular Aquatics

The wetland types can be further categorized as:

- Water Regime Modifier
 - Saturated (saturated at or near the surface)
 - Seasonally flooded (0> to 6 inches inundation)
 - Intermittently exposed (6 inches to 2.5 feet inundation)
 - Permanently flooded (year round inundation)

These wetland types represent the significant majority of those that occur locally and within the Bank GSA, as per the stated goals and objectives of the Bank.

8.4 Change in Function

Identified wetland functions and services will be improved in the watershed as shown in Table 8-2.

Table 8-2. Existing and Proposed Wetland Functions and Services for All Community Types

Function/Service	Existing Rating	Mitigation Work	Proposed Rating
Plant Community Composition	Low: Three vegetation classes present. Forested, which is comprised of Russian olive as the only tree species; scrub shrub with Russian olive and salt cedar as only species present; emergent marsh dominated by reed canarygrass.	Mow, apply herbicide, create micro-topography, and plant more desirable wetland species in large areas dominated by reed canarygrass, salt cedar and Russian olive.	High: Vegetation throughout the Bank site will be enhanced by planting desirable native wetland plant species, controlling invasive species such as Russian olive, salt cedar, reed canarygrass, common reed and other perennial and annual weeds.
General Wildlife Habitat	Low: The site is presently moderately to intensively grazed by domestic horses and cattle. Construction equipment operates on the site at the topsoil composting facility. A dog kennel presently occupies a portion of the site.	Grazing will be eliminated or controlled to benefit vegetation communities; the composting facility will be removed from the site; the dog kennel will be removed from the site. Habitat structures will be installed including brush piles, logs with root wads and nesting boxes.	High: An increase in wetland size, plant diversity, and improvement in the overall quality of habitat will attract and support more wildlife and a diverse number of species.

Table 8–2. Existing and Proposed Wetland Functions and Services for All Community Types

Function/Service	Existing Rating	Mitigation Work	Proposed Rating
General Fish/Aquatic Habitat	Low: The existing open water pond covering 8.56 acres provides habitat for fish and aquatic species.	Some tree and shrub species would be planted at the edges of the pond to provide shade and cover for aquatic species. The edge of the pond would be modified to create an irregular edge and portions of the pond will be filled to create more wetland habitat.	High: Plantings would provide cover and enhanced habitat over time. Interspersion of wetlands within the open water would provide diverse habitat for bird and wildlife species. Birds could nest on islands within the pond and be more protected from predators.
General Amphibian Habitat	Low: Presently the site is moderately to intensively grazed by horses and cattle affecting the quality of existing habitat.	Remove or significantly reduce grazing and provide trees with root wads for cover; increase the area of saturation and inundation which would increase the area of potential habitat.	High: Removing or reducing grazing and enhancing soil inundation, saturation and desirable plant diversity will increase habitat for amphibians and other wetland species.
Flood Attenuation	Moderate to High: The site presently stores runoff from snowmelt and precipitation events.	Increase the wetland acreage on the site by restoring former wetland areas back to functional wetlands. Plan erect vegetation to slow water velocities.	High: Riparian and emergent vegetation helps to attenuate flood action by reducing water velocity. Urbanization in the watershed is rapidly increasing stormwater runoff volumes. This increase in wetland acreage will provide greater capacity in the watershed for storing and attenuating flood flows.
Short and Long-term Surface Water Storage	High: The site presently stores surface runoff from snowmelt and precipitation events. The site stores this water when the ground is frozen and infiltration is prohibited.	Grading will be conducted in some areas to create more storage volume capacity.	High: Volume of storage will be increased.
Sediment / Nutrient / Toxicant Retention & Removal	Moderate to High: Horse and cattle grazing contributes nutrients to the site that are up-taken by the wetlands.	Increase the size of the wetland area. Remove horse and cattle grazing.	High: The wetlands' capacity to remove nutrients and toxicants would be increased with increased size although, some potential nutrient loading would be reduced because cattle and horses would be removed.

Table 8–2. Existing and Proposed Wetland Functions and Services for All Community Types

Function/Service	Existing Rating	Mitigation Work	Proposed Rating
Sediment / Shoreline Stabilization	<u>Moderate:</u> Horse and cattle grazing contributes to erosion and sediment generation and destabilization of soils along ditches that run through the site.	Increase the size of the wetland area. Remove horse and cattle grazing. Stabilize and plant desirable species around pond perimeter and along ditches.	<u>Moderate to High:</u> Wetland size will be expanded, increasing the amount of wetland area available for sediment stabilization.

9.0 Assurance of Sufficient Water Rights to Support the Long-Term Sustainability of the Mitigation Bank

9.1 Hydrology Description

Surface water flows across the Bank site originating from natural springs, stormwater runoff, and tile drains from agriculture fields located to the north conveyed through a network of drain ditches. The groundwater table is near the surface in some locations on the site. The project site is in an apparent groundwater discharge area based on the adjacent Utah Lake and the observation of springs at the project site.

Previous studies (DNR 1985) confirm this to be a groundwater discharge area. According to the Utah Department of Natural Resources, the movement of ground water in the valley is generally from the mountains towards Utah Lake. A relatively small quantity of water is directly discharged to the lake, but large quantities of ground-water are discharged adjacent to the lake which then flows via drains and waterways to Utah Lake to make up a significant quantity of the water supply. Ground water generally moves from the mountains to Utah Lake and the Jordan River. Other areas indicating water discharge from the shallow artesian aquifer are near the U.S. Steel Co., Geneva Works (Anderson Geneva), and around Provo Bay (DNR 1985).

The flow regime is typical of western valleys with snowmelt from the surrounding mountains, which contributes to large spring runoff events followed by a long period of baseflow. The baseflow is largely a result of the percolation of the snowmelt into alluvial fans. The major drainages are the Provo and American Fork Rivers with numerous smaller intermittent and ephemeral streams/drains that also flow to Utah Lake.

9.2 Quantity Required

The volume/rate of flow needed to support wetlands at the Bank site was calculated in a water balance or budget. The budget is simply an accounting of inflows and outflows to the wetland area. When the outflow exceeds the inflow, additional water is necessary to maintain the wetland plant communities. The water mass balance may account for numerous water movements; however, many of the potential flows are relatively insignificant compared to the major

contributors. The main contributors are precipitation, evapotranspiration, soil water capacity, and surface water. Additional interactions such as stormwater runoff, snowmelt, sublimation, and soil infiltration were not explicitly accounted for and instead assumed as part of the main contributors.

The monthly precipitation was based on the daily precipitation record at Utah Lake, Lehi (USU, 2008). Monthly averages were calculated along with the 95th percentile. Only 80 percent of the precipitation during the growing season was assumed to be effective.

The results of the water balance evaluation indicate that to provide water for 102 acres a total of approximately 408-acre feet of water would be necessary for the consumptive use, evaporation and return flow. This estimate is based on 4 acre-feet per acre and a return flow of 2 acre-feet per acre. Review of the surrounding surface and groundwater resources indicate sufficient water is available. Water rights must be obtained to cover the water from these sources.

9.3 Water Sources for Bank

Surface water should provide an adequate additional source of water as the local ditches in the vicinity of the project have a consistent baseflow from groundwater, seeps, and springs.

The site will be graded to intercept groundwater. Groundwater measurements were taken June 23, 2008 in 3 newly drilled wells. Water levels ranged from 2.5-feet to 3.95 feet in depth. Groundwater depths will be monitored through the summer of 2008.

UDOT has a contract with a water rights attorney to provide legal counsel for acquiring the required water rights for the project and to make sure all of the legal documents pertaining to those water rights have been prepared and filed with the State Engineer's office (Utah Department of Water Rights).

10.0 References

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